

Kinetics of transpiration in soil arthropods*

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Water loss rates are very different in soil arthropods. Comparing the rates of the silverfish *Lepisma saccharina* and an euedaphic *Onychiurus* species, the water loss of the latter is about 900 times higher. 20 species or life types have been compared. Basing on gravimetric measurements with a recording electrobalance, a typical sequence of water loss is given. As a rule, it can be shown that three periods of dehydration can be distinguished, following from the fully hydrated stage to the total dehydration, if the animals are placed to a lower humidity : 1) a short *initial period* as a result of short time adaptation for the integument to the surroundings, 2) a longer *linear period* with a constant transpiration rate and 3) an *exponential period*, when the animals have lost all their water reserves. Regarding the ability to conserve body water, a classification is given, based on five groups :

		Water loss rates for the linear period of transpiration at 0 % r.h. / 22° C	
Humid-air animals	extreme hygic	> 50 %/h	
Humid-air animals	hygic	< 50 %/h	> 10 %/h
Humid-air/dry-air animals	transitional forms	< 10 %/h	> 1 %/h
Dry-air animals	mesic	< 1 %/h	> 0.1 %/h
Dry-air animals	xeric	< 0.1 %/h	

The water loss rates are expressed as Δm [%/h] which means the changing of the initial water content m_0 of normally hydrated animals under natural or comparable conditions. These rates are very useful to cha-

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racterize the ecological situation and the influence of transpiration ~~for~~ the water budget of the animals. For example, small immature specimens often lose their water with higher rates than adults. Additionally, the absolute values of transpiration should be given in each case.